

WHAT IS CLAIMED IS:

1. A gas turbine engine, comprising:  
a compressor section;  
a combustion section downstream of the compressor section;  
a turbine section downstream of the combustion section;  
an axial flow plenum extending through the engine, the axial flow plenum having at least one outlet fluidically coupled to the turbine section; and  
at least one fluid flow directional modifier disposed proximate the axial flow plenum.
2. The gas turbine engine of claim 1, wherein the fluid flow directional modifier is a turning foil.
3. The gas turbine engine of claim 1, wherein the fluid flow directional modifier is a turning hole.
4. The gas turbine engine of claim 1, wherein the fluid flow directional modifier is a turning groove.
5. The gas turbine engine of claim 1, wherein the fluid flow directional modifier directs fluid radially inwardly.
6. The gas turbine engine of claim 1, wherein the fluid flow directional modifier directs fluid radially outwardly.
7. The gas turbine engine of claim 1, wherein the fluid flow directional modifier encourages parasitic leakage air to be introduced into the turbine section in a direction substantially aligned with an overall combustion gas flow path through the turbine section.

8. A gas turbine engine, comprising:

a compressor section injecting ambient air and exhausting compressed air;

a combustion section downstream of the compressor section and receiving the compressed air, the combustion section introducing fuel to the compressed air and igniting the fuel and air to result in combustion gases;

a turbine section downstream of the combustion section, combustion gases traversing from the combustion section through the turbine section along a combustion gas flow path; and

a turbine section cooling and parasitic leakage system proximate the turbine section, the turbine section cooling system directing cooling and parasitic leakage air into the turbine section substantially in the direction of the combustion gas flow path.

9. The gas turbine engine of claim 8, wherein the turbine section cooling and parasitic leakage system includes a fluid flow directional modifier.

10. The gas turbine engine of claim 9, wherein the fluid flow directional modifier is a turning foil.

11. The gas turbine engine of claim 9, wherein the fluid flow directional modifier is a turning hole.

12. The gas turbine engine of claim 9, wherein the fluid flow directional modifier is a turning groove.

13. The gas turbine engine of claim 9, wherein the fluid flow directional modifier is radially inward of the turbine section.

14. The gas turbine engine of claim 9, wherein the fluid flow directional modifier is radially outward of the turbine section.

15. The gas turbine engine of claim 8, wherein the turbine section cooling and parasitic leakage system directs cooling and parasitic leakage air circumferentially through the turbine section.

16. A method of operating a gas turbine engine, comprising:  
compressing air in a compressor section of the gas turbine engine;  
directing the compressed air into a combustion section of the gas turbine engine;  
injecting fuel into the combustion section of the gas turbine engine thereby igniting the fuel and compressed air to create combustion gases;  
directing the combustion gases from the combustion section into a turbine section of the gas turbine engine along a combustion gas flow path; and  
introducing cooling and parasitic leakage air into the turbine section substantially in the direction of the combustion gas flow path.

17. The method of claim 16, wherein the cooling and parasitic leakage air is introduced from a position radially inward of the turbine section.

18. The method of claim 16, wherein the cooling and parasitic leakage air is introduced from a position radially outward of the turbine section.

19. The method of claim 16, wherein the cooling and parasitic leakage air is introduced using turning foils.

20. The method of claim 16, wherein the cooling and parasitic leakage air is introduced using turning holes.

21. The method of claim 16, wherein the cooling and parasitic leakage air is introduced using turning grooves.